

EOS Science Networks Performance Report

This is a summary of EOS QA and SCF performance testing for the 2nd quarter of 2015 -- comparing the performance against the requirements, including Terra, QuikScat, Aqua, Aura, ICESat, NPP, OCO2, SMAP, and GIBS requirements.

Current results can be found on the EOS network performance web site (ENSIGHT): http://ensight.eos.nasa.gov/active_net_measure.html. Or click on any of the site links below.

Highlights:


- Requirements updated to use the June 2014 database
 - [TRMM Requirements removed](#)
- There are still sites with requirements, but are not tested:
 - JRC (Ispra, Italy), JAXA (Japan).
- Performance was mostly stable
 - **All nodes now rated Excellent!**
 - **GPA 4.0 ! (same as last 4 quarters)**

Ratings:

Rating Categories:

Excellent	: median of daily worst cases > 3 x requirement
Good	: median of daily worst cases > requirement
Adequate	: median of daily worst cases < requirement and median of daily medians > requirement
Almost Adequate	: requirement > median of daily medians > requirement / 1.5 (i.e., median thruput is below requirement, but above requirement without contingency)
Low	: median of daily medians < requirement / 1.5.
Bad	: median of daily medians < requirement / 3.

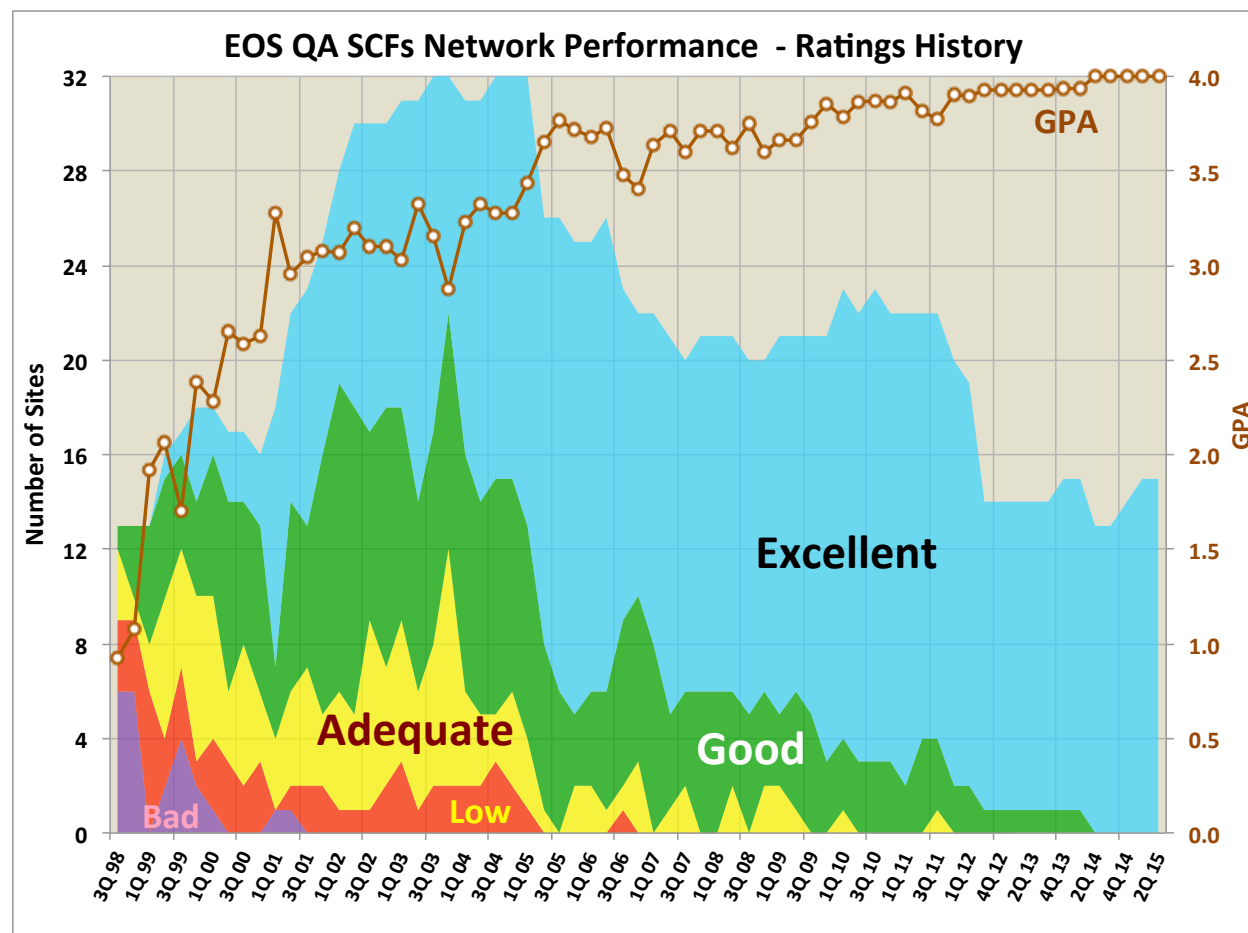
Ratings Changes:

Upgrades:  None

Downgrades:  None

Ratings History:

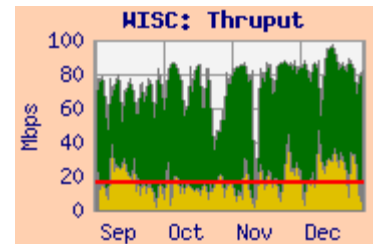
The chart below shows the number of sites in each classification since 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



Notes: The number of sites included in this chart has changed since 1Q'05 due to:

- 2Q05: Moving the reporting for 6 SIPS sites to the "EOS Production Sites" Network Performance Report.
- 2006: Testing discontinued to SAGE III Nodes, NOAA, UMD, UIUC
- 2Q07: Testing discontinued to U Washington
- 1Q09: Testing added to BADC (RAL).
- 2010: Testing to Oxford restored, ICESAT functions of Ohio State were transferred to Buffalo, testing to Buffalo added, Testing to Ohio State discontinued.
- 3Q10: UIUC added [back]; Testing to MIT discontinued
- 2Q11: Testing discontinued to LANL, PNNL; requirements added to CCRS and Univ of Auckland
- 4Q11: Testing to JRC discontinued, Wisconsin moved to production sites report.
- 1Q12: Testing to Univ Auckland, NZ failing.
- 2-3Q12: Discontinued testing to Arizona, UCSD, Colo State, Miami, Montana, SUNY SB, and Buffalo – no longer any requirements. Added testing to Hawaii, ORNL.
- 4Q13: Testing to Auckland, NZ restored.
- 2Q14: Removed results from BADC (RAL) and Toronto -- no longer any requirements.
- 4Q14: Restored results from Toronto – requirements had been removed erroneously.
- 1Q15 Restored testing to University of Washington.

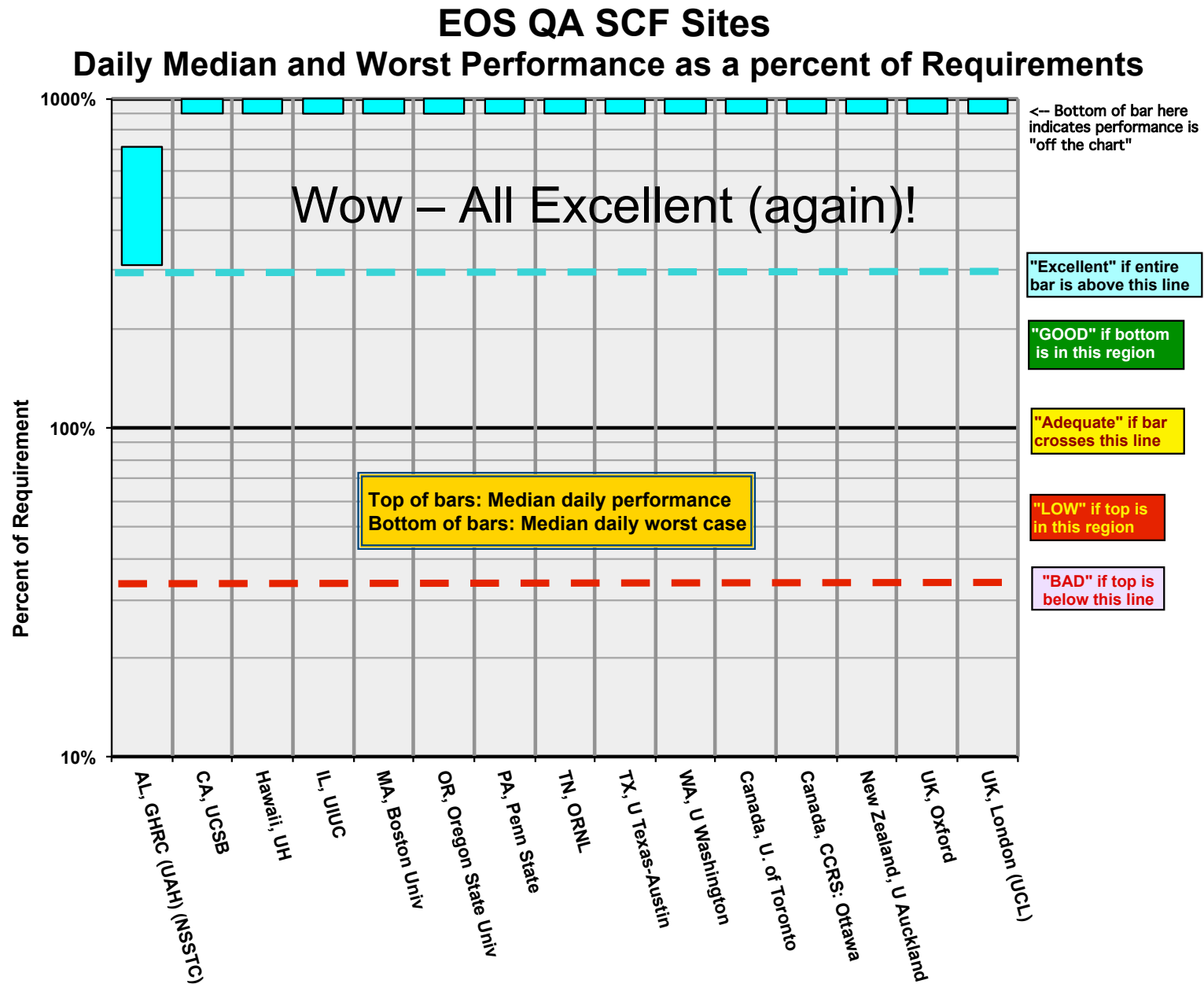
Integrated Charts: Integrated charts are included for selected sites with the site details. These charts are “Area” charts, with a pink background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC/EBnet, in this example) to the destination facility (e.g., Wisconsin, in this example) obtained from routers via “netflow”. The green area is stacked on top of the user flow, and represents the “adjusted” daily average iperf thrupt between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. The adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities.



Note: User flow data is has not been available from LaRC since March 2007, so sites with primary requirements from LaRC will not include integrated graphs. (But JPL \leftrightarrow LaRC flow data is available from JPL, and GSFC-EBnet \leftrightarrow LaRC is available from EBnet).

EOS QA SCF Sites Summary: Network Requirements vs. Measured Performance

2 nd Quarter 2015				Testing							
Destination	Team (s)	Requirements		Source Node	Median Daily Best	Median mbps	Median Daily Worst	Average User Flow	Rating re Current Requirements		Route Tested
		Jun-14	Jun-12						2Q 2015	1Q 2015	
AL, GHRC (UAH) (NSSTC)	MODIS, LANCE	2.9	2.9	GSFC-EDOS	371.7	20.7	9.0	10.8	Excellent	Ex	NISN - MSFC - GHRC
CA, UCSB	MODIS	0.17	0.2	GSFC-MODIS	292.2	271.1	265.2	0.10	Excellent	Ex	EBnet - MAX - Internet2 - CENIC
Hawaii, UH	MODIS	0.02	0.0	GSFC-ENPL	2139.8	2081.0	1904.8	2.8	Excellent	Ex	EBnet - MAX - Internet2 - LA
IL, UIUC	MISR	0.56	0.56	LaRC PTH	189.5	184.8	102.5		Excellent	Ex	NISN - MAX - Internet2 - StarLight (Chicago)
MA, Boston Univ	MODIS, MISR	0.69	2.6	LaRC ASDC	339.3	193.6	105.4		Excellent	Ex	NISN - MAX - Internet2 - NOX
OR, Oregon State Univ	CERES, MODIS, MISR	0.69	0.7	LaRC ANGe	243.7	239.2	178.5		Excellent	Ex	NISN - MAX - Internet2 - PNW
PA, Penn State	MISR	0.6	0.6	LaRC ANGe	381.7	294.9	192.7		Excellent	Ex	NISN - MAX - 3ROX
TN, ORNL	MODIS	19.2	10.1	GSFC-ENPL	8952.4	8531.7	5285.9		Excellent	Ex	MAX - ESnet
TX, U Texas-Austin	MODIS	0.67	0.67	GSFC-ESDIS-PTH	548.2	528.5	480.8	0.13	Excellent	Ex	MAX - Internet2 - TX-learn
WA, U Washington	MISR	2.4	2.4	LaRC PTH	181.8	180.7	167.6		Excellent	Ex	Internet2 via NISN / MAX
Canada, U. of Toronto	MOPITT, GEOS	0.1	0.1	LaRC ANGe	660.7	429.1	117.9		Excellent	Ex	NISN - StarLight (Chicago) - CA*net
Canada, CCRS: Ottawa	CEOS, MODIS	1.1	1.1	GSFC-MODIS	290.5	251.0	242.5	4.7	Excellent	Ex	EBnet - MAX - Internet2 - CA*net
Italy, Ispra (JRC)	MISR	9.7	9.7		n/a	n/a	n/a				NISN / MAX / Géant (DC) / GARR
New Zealand, U Auckland	MISR	0.28	0.28	LaRC PTH	66.4	58.0	50.4		Excellent	Ex	NISN - StarLight (Chicago) - I2 - Reannz
UK, Oxford	HIRDLS	0.15	0.37	GSFC-ENPL-PTH	3109.9	2205.9	1092.8	0.44	Excellent	Ex	MAX - Géant (DC) - JAnet
UK, BADC (RAL)	HIRDLS	-0-	0.2	GSFC-ESDIS-PTH	130.5	116.7	79.4	15.8			EBnet - MAX - Géant (DC) - JAnet
UK, London (UCL)	MISR, MODIS	0.56	0.56	LaRC PTH	146.3	136.4	45.3		Excellent	Ex	NISN - MAX - Géant (DC) - JAnet
		Significant Change					Summary				
	*Rating Criteria:								Current:	Prev	
								Rating	2Q 2015	Report	
Excellent	Median Daily Worst >= 3 * Requirement							Excellent	15	15	
Good	Median Daily Worst >= Requirement							Good	0	0	
Adequate	Median Daily Worst < Requirement <= Median Daily Median							Adequate	0	0	
LOW	Median Daily Median < Requirement							LOW	0	0	
BAD	Median Daily Median < Requirement / 3							BAD	0	0	
								Total	15	15	
								GPA	4.00	4.00	



Details on individual sites:

Note: Each site listed below is the DESTINATION for all the results reported in that section. Other tests are also listed. The three values listed are derived from [nominally] 24 tests per day. For each day, a daily best, worst, and median is obtained. The values shown below are the medians of those values over the test period.

1) AL, GHRC (UAH) (aka NSSTC)

Teams: AMSR, MODIS, LANCE

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml>

Rating: Continued **Excellent**

Domain: nsstc.uah.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-EDOS	371.7	20.7	8.7	NISN / MSFC

Requirements:

Source Node	FY	Mbps	Rating
MODIS	'12 –	2.9	Excellent

Comments: Testing was initiated in December '10 from GSFC-EDOS via both NISN and Internet2 for LANCE flows. Testing from MODAPS-PDR via I2 was initiated in November '12. That testing was discontinued in March 2014 – on request from the GHRC POC.

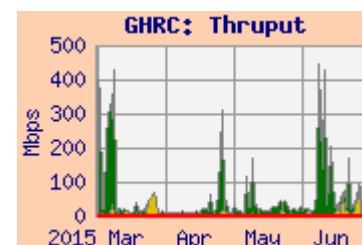
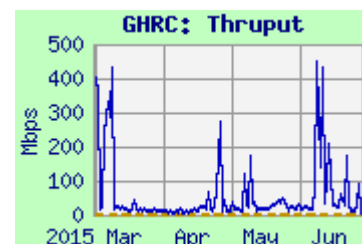
Testing was initiated at the end of April 2014 from **GSFC-ENPL** and **LaRC-PTH** to a bwctl server at UAH. This testing failed in Mid May, was restored in July, then failed again in late July.

Testing to a new LANCE Server via NISN was started in October 2014. Thruput became very noisy in February 2015, and dropped in March, but the median integrated thruput was 23.3 mbps, and the median daily worst was 9.04 mbps. So the median daily worst integrated thruput remained above 3 x the MODIS requirement, so the rating remains **Excellent**

User flow is measured for GSFC to GHRC, combined for the NISN and UAH addresses. The major flow is MODIS NRT to NISN addresses, but both paths have significant user flows. **The average user flow this quarter was 10.8 mbps – over 3 x the requirement!**

Notes:

- There is no longer a CERES requirement from LaRC (was 6.9 mbps).
- Testing between GHRC, RSS and NSIDC for AMSR-E (Aqua) is now in the "Production Sites" report.



2) CA, UCSB :

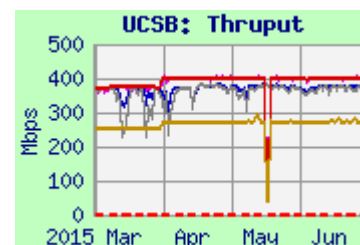
Teams: MODIS

Web page: <http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml>Ratings: GSFC: Continued **Excellent**

Domain: ucsb.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	292.2	271.1	265.2	MAX / I2 / CENIC
GSFC-GES DISC	402.1	400.8	391.6	
GSFC-ENPL	404.0	401.0	278.0	
EROS-LPDAAAC	379.4	376.2	330.2	StarLight / I2 / CENIC
EROS-PTH	380.0	370.0	299.0	

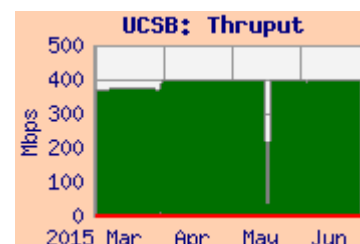
**Requirements:**

Source Node	FY	kbps	Rating
GSFC	'12 -	170	Excellent

Comments: The GSFC requirement was reduced (was 3.1 mbps), and the EROS requirement was eliminated (was 2.2 mbps) in the 2012 database update.

Thruput from all sites improved slightly at the beginning of April, due to reduced RTT (e.g., was 80 ms from GES Disc, changed to 75 ms). Thruput was well above the requirement, so the rating from **GSFC-MODIS** remains **Excellent**.

The user flow from GSFC averaged only about 100 kbps this period, below the 810 kbps average flow last quarter and the requirement. The user flow from **EROS-LPDAAAC** averaged 560 kbps this period, well below the old requirement.

**3) HI, University of Hawaii:**

Team: MODIS

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/HAWAII.shtml>Ratings: GSFC: Continued **Excellent**

Domain: uhnet.net

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	2139.8	2081.0	1904.8	MAX / I2 / LA / UHnet
GSFC-ESTO	921.1	915.1	900.3	

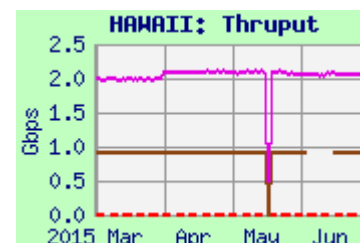
Requirements:

Source Node	FY	kbps	Rating
GSFC-MODIS	'12 -	21	Excellent

Comments: Testing was initiated to a PerfSonar node at UH in April '12, based on a [very small] MODIS requirement in the new ICD. Performance from **GSFC-ENPL** improved in April '13 when testing was switched to use its 10 gig interface to a 10 gig PerfSonar node at the University of Hawaii.

The thruput from **GSFC-ENPL** is much more than the tiny requirement, so the rating remains **Excellent**. User flow from EBnet this month was 2.8 mbps, many times higher than the requirement.

Testing from **GSFC-ESTO**, provides an alternate source, if **GSFC-ENPL** is down. Its thruput is very stable, and consistent with its Gig-E interface limitation.



4) IL, UIUC (NCSA):

Teams: MISR

Web page: <http://ensight.eos.nasa.gov/Missions/terra/UIUC.shtml>Rating: LaRC: **Excellent**

Domain: uiuc.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	189.5	184.8	102.5	NISN / Chicago / StarLight / MREN
GSFC-NISN	735.5	323.3	95.8	
GSFC-ENPL	868.9	819.6	610.7	MAX / Internet2 / StarLight / MREN

Requirements:

Source Node	FY	kbps	Rating
LaRC ASDC	'12 -	556	Excellent

Comments: Testing was added to UIUC in August '10. Initially, SCP testing was initiated from GSFC and LaRC, sending files to UIUC. SCP thrupt was noisy from both sources, and somewhat bimodal.

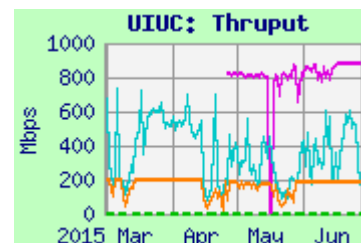
In March 2012, testing from GSFC-NISN and LaRC PTH was switched to a NCSA PerfSonar server at UIUC, with greatly improved thrupt. The SCP tests were discontinued in May 2012.

Thruput from both GSFC-NISN and LaRC PTH to the UIUC PerfSonar server was seriously affected by the MODIS reprocessing flow to EROS, which began in February. Both flows use the NISN SIP 10 gbps backbone to the NISN Chicago CIEF, then a NISN tail circuit to the StarLight gigapop. The MODIS flow is close to the circuit capacity, and apparently causes congestion in Chicago, reducing the performance to UIUC.

So a test was added in April to UIUC from GSFC-ENPL – which uses Internet2 to Chicago, not NISN. The results from this test are much higher and more stable than from the NISN sources.

This NISN congestion problem in Chicago was resolved in late May, with an upgrade to the NISN configuration in Chicago. Performance from NISN sources was stable after that.

The thrupt from LaRC remains well above the revised requirement (which was 1.1 mbps previously); the rating remains **Excellent**. Note that outflow from LaRC PTH is limited to 200 mbps by agreement with CSO / NISN.



5) MA, Boston Univ:

Teams: MODIS, MISR

Domain: bu.edu

Ratings: EROS: Continued

ExcellentWeb Page: <http://ensight.eos.nasa.gov/Missions/terra/BU.shtml>

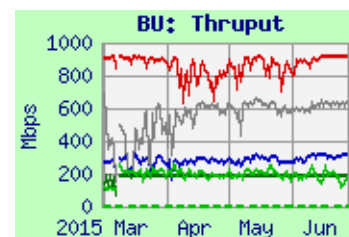
LaRC: Continued

Excellent**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	330.8	287.3	175.8	StarLight / I2 / NOX
EROS PTH	653.0	609.5	478.0	
GSFC GES DISC	920.8	873.6	486.5	MAX / I2 / NOX
LaRC ASDC	339.3	193.6	105.4	NISN / MAX / I2 / NOX
LaRC PTH	191.0	191.0	182.0	

Requirements:

Source Node	FY	mbps	Rating
EROS LPDAAC	'12 -	2.6	Excellent
LaRC ASDC DAAC	'12 -	0.7	Excellent



Comments: Thruput from **EROS LPDAAC** was noisy, but much better than the [revised lower, was 3.0 mbps] requirements, rating **Excellent**. The user flow from **EROS** averaged only about 60 kbps for this period –well below the requirement. Testing from **EROS PTH** stabilized in April, and was much higher than from **LPDAAC**.

Testing from **LaRC ASDC DAAC** greatly exceeded the requirements, rating **Excellent**.

Performance from **LaRC PTH** was very steady, but is limited to 200 mbps by agreement with CSO / NISN.

Performance from **GSFC GES DISC** was higher than from any other source. There is no longer a requirement for dataflow from GSFC to BU.

6) OR, Oregon State Univ:

Teams: MISR

Ratings: LaRC ANGe: Continued

ExcellentWeb Page: <http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml>

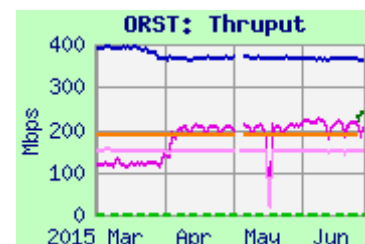
Domain: oce.orst.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe	243.7	239.2	178.5	NISN / MAX / I2 / PNW
LaRC PTH	190.0	189.7	187.7	
JPL PODAAC	373.0	366.8	353.4	CENIC / I2 / PNW
GSFC-ESDIS-PTH	155.3	150.3	141.5	MAX / I2 / PNW
GSFC-ENPL	224.5	206.5	164.5	

Requirements:

Source Node	FY	kbps	Rating
LaRC ANGe	'12 -	694	Excellent
GSFC	'02 – '11	250	Excellent



Comments: The requirements were reduced when the requirements for CERES and MODIS were eliminated in 2012.

Thruput was quite stable from all sources for this period, and was well above the requirements. Testing was started from **LaRC PTH** when the **LaRC ANGe** node was retired, with stable results. Testing from **LaRC ANGe** was restored in June, and thruput was higher than from **LaRC PTH**; the rating remains **Excellent**. Results from the East coast sites are limited by the longer RTT and a small window size at ORST, but improved with retuning to use more streams.

7) PA: Penn State Univ:

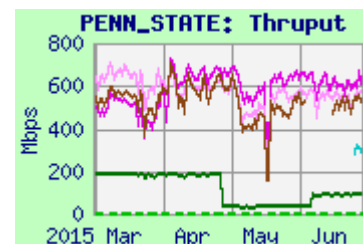
Team: MISR

Web Page: http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtmlRating: Continued **Excellent**

Domain: psu.edu

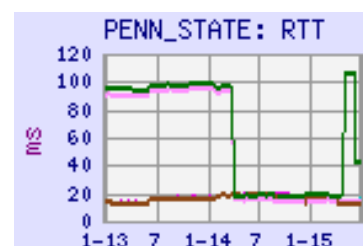
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-ANGe	381.7	294.9	192.7	NISN / MAX / I2 / 3ROX
LaRC-PTH	95.8	86.6	62.5	
GSFC-ESDIS-PTH	688.5	558.1	401.7	MAX / I2 / 3ROX
GSFC-ENPL	750.0	624.5	431.0	
GSFC-ESTO	689.1	529.0	348.9	

**Requirements:**

Source Node	FY	kbps	Rating
LaRC ASDC DAAC	'03 -	556	Excellent

Comments: As the RTT graph shows, the return route problem (to LaRC-PTH) came back in late April, after being fixed in March 2014. The RTT increased from 19 ms to 105 ms at that time, reducing thrupt. The problem was partially corrected in early June, with the RTT dropping to 43 ms. Performance from LaRC-PTH varied inversely to the RTT.



The RTT from LaRC-ANGe, which necessarily takes the same forward route, was stable at 19 ms, after testing resumed in late June. Performance from LaRC-ANGe was mostly steady. Based on the low [reduced from 2.6 mbps] requirement, the rating remains

Excellent.

Testing from GSFC sites was retuned in January, adding more parallel streams. From GSFC-ESTO (on the SEN at GSFC, not EBnet) and from GSFC-ENPL (direct 10GigE to MAX), the RTT has always been lower (due to the optimum return route), and the thrupt was thus much higher than from other sources until they were fixed.

8) TN, Oak Ridge National Lab:

Teams: MODIS, DAAC

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ORNL.shtml>Rating: GSFC: **Excellent**

Domain: ornl.gov

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-NISN	788.8	342.6	270.1	NISN / MAX / ESnet
GSFC-ENPL-PTH	8952.4	8531.7	5285.9	MAX / ESnet
GSFC-ESTO	983.6	982.9	978.5	

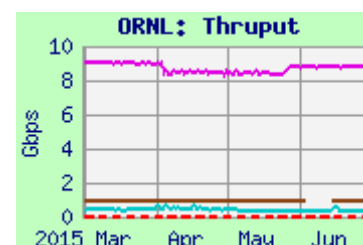
Requirements:

Source Node	FY	mbps	Rating
GSFC	'14 -	19.2	Excellent

Comments: The requirement was increased with the June '14 database update – was 10.1 mbps previously.

Thruput from GSFC-ENPL-PTH a 10 gig connected node at GSFC, to the 10 gig PerfSonar node at ORNL, was stable and excellent.

Thruput from GSFC-NISN and GSFC-ESTO was also mostly stable, and well above the requirement; the rating is therefore **Excellent**.



User flow from EBnet has been minimal, however, averaging only about 4 kbps this period. (But the flow monitor might be missing some EBnet to ORNL flows).

9) TX: Univ. of Texas - Austin:

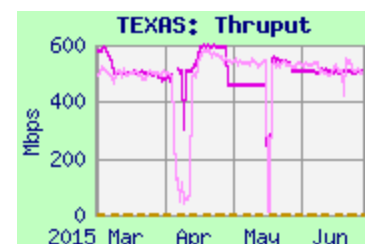
Team: MODIS, ICESAT

Web Page: <http://ensight.eos.nasa.gov/Missions/icesat/TEXAS.shtml>Rating: Continued **Excellent**
Domain: utexas.edu**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	552.0	506.3	486.0	MAX / I2 / TX
GSFC-ESDIS-PTH	548.2	528.5	480.8	

Requirements:

Source Node	FY	kbps	Rating
GSFC-MODIS	'12 -	666	Excellent



Comments: Median thrupt from GSFC-ESDIS-PTH was well above 3 x the MODIS requirement, so the rating remains **Excellent**. Average user flow from GSFC this month was 130 kbps, well below the requirement (without contingency).

From GSFC-ENPL-PTH, thrupt is very similar. This test was moved to a PerfSonar node at UT in August 2012, with greatly improved results. The results improved further in September 2013, with the switch to the 10 gig interface from GSFC-ENPL-PTH. In November 2013, the Texas PerfSonar server stopped responding, so testing was switched back to the SCF.

The previous 11.1 mbps ICESAT requirement has been eliminated, and testing from ICESAT discontinued.

10) WA: University of Washington:

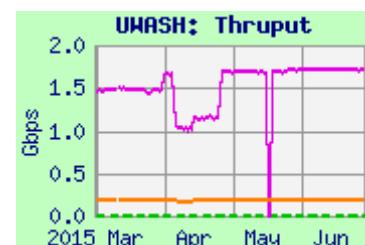
Teams: MISR

Rating: GSFC: **Excellent**
Domain: washington.eduWeb Page: <http://ensight.eos.nasa.gov/Missions/terra/UWASH.shtml>**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	181.8	180.7	167.6	NISN / MAX / Internet2 / PNW
GSFC-ENPL-PTH	1725.1	1693.7	1628.3	MAX / Internet2 / PNW

Requirements:

Source Node	FY	mbps	Rating
GSFC	'14 -	2.4	Excellent



Comments: Testing was added to a 10 gig U Wash PerfSonar node in January 2015 from GSFC-ENPL-PTH and LaRC-PTH, with excellent performance.

Thruput from LaRC-PTH was very stable, and well above the requirement, rating **Excellent**. Outflow from LaRC-PTH is limited to 200 mbps by agreement with CSO / NISN.

Testing from GSFC-ENPL-PTH was also very stable, and exceeded 1 gbps.

11) Canada, Univ of Toronto:Rating: GSFC: Continued **Excellent**

Team: MOPITT

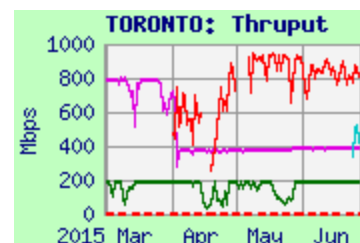
Domain: utoronto.ca

LaRC: Continued **Excellent**Web Page: <http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml>**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	191.3	188.9	63.9	NISN / StarLight / CA*net
LaRC ANGe	660.7	429.1	117.9	
ESDIS-PS	934.1	813.1	282.0	MAX / I2 / NY / CA*net
ENPL-PTH	379.0	378.0	249.0	

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 – '13	100	Excellent
GSFC EOC	'02 – '13	512	Excellent



Comments: Testing from **GSFCENPLPTH** and **LaRC PTH** was retuned in December 2014, with improved results. Performance from **LaRC PTH** was steady, limited to 200 mbps by agreement with CSO / NISN. It was much higher than the tiny requirement, rating **Excellent**.

Thruput from **LaRC PTH** was also affected by the MODIS to EROS flow until the congestion was fixed in May, since it shares the NISN to StarLight circuit (see 4-UIUC).

Testing was restored from **LaRC ANGe** in late June. **LaRC ANGe** is not limited to 200 mbps outflow, and gets much higher thruput than from **LaRC PTH**.

From GSFC, thruput from **ENPL-PTH** dropped in early April. Testing was added from **ESDIS-PS** (on EBnet) for comparison. Performance from **ESDIS-PS** was better than from **ENPL-PTH**, and also well above the requirement, rating **Excellent**. User flow from GSFC averaged only 6 kbps for this period.

12) Canada: CCRS (Ottawa)

Teams: MODIS, CEOS

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/CCRS.shtml>Rating: Continued **Excellent**Domain: ccrs.nrcan.gc.ca**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODAPS	290.5	251.0	242.5	MAX / I2 / CA*net
GSFC-ENPL	358.0	346.0	256.0	

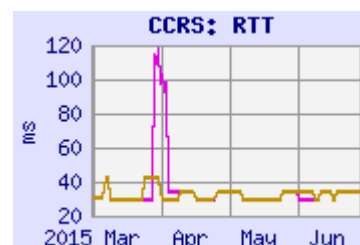
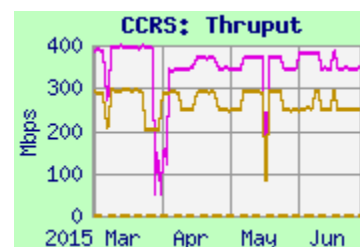
Requirement:

Source Node	FY	mbps	Rating
GSFC-MODAPS	'11 -	1.1	Excellent

The MODIS requirement was reduced from 3.8 mbps through FY'10. Performance from both sources was stable for sustained periods, with throughput step changes corresponding inversely to RTT changes. Testing from both sources improved in January with retuning to use more streams. Throughput from **GSFC-MODAPS** was otherwise stable, and remained much more than 3 x the requirement, so is rated **Excellent**.

Throughput from **GSFC-ENPL** was also stable.

User flow from GSFC averaged 4.7 mbps this period, below the 5.8 mbps last quarter, but much higher than the requirement (but more consistent with the old requirement).

**13) New Zealand**

Team: MISR

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/NZL.shtml>Rating: **Excellent**Domain: reannz.co.nz**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	66.4	58.0	50.4	NISN / NTT (San Jose) / AARnet (LA) / ReanNZ
GSFC-ENPL-PTH	430.2	418.5	403.2	MAX / I2 / PNW / ReanNZ

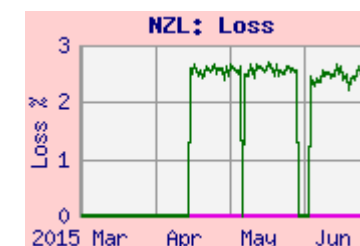
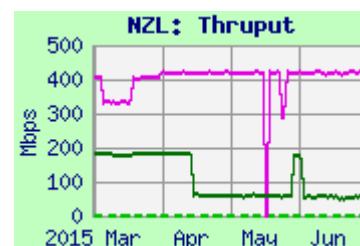
Requirements:

Source Node	FY	kbps	Rating
LaRC	'02 -	300	Excellent

Comments: Testing to the University of Auckland was discontinued in November 2011. Testing was reinstated in October 2013, to a PerfSonar node in Auckland provided by the Reannz network. Note that the route to the University of Auckland uses Reannz – so the results are plausibly applicable.

Performance from **LaRC PTH** dropped in April, due to packet loss on a suboptimal route. But throughput consistently remained much higher than the requirement, so the rating is **Excellent**. Note that throughput from **LaRC PTH** is limited to 200 mbps by agreement with CSO/NISN.

Throughput from **GSFC-ENPL-PTH** was stable, using the preferred route, and better than that from **LaRC PTH**.



14) UK, Oxford Univ.:

Team: HIRDLS

Web Page: <http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml>Rating: Continued **Excellent**

Domain: ox.ac.uk

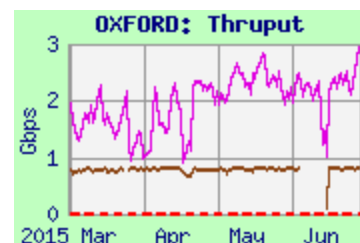
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	3109.9	2205.9	1092.8	MAX / I2 / Géant (DC) / JAnet
GSFC-ESTO	853.9	796.1	433.5	

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03 –	368	Excellent

Comments: Beginning in late March 2012, testing was switched to a PerfSonar server at Oxford, using iperf. Testing previously had used, “flood pings”, which is a poor substitute for iperf, and provided much lower results. Performance improved again in June 2012 when the Oxford PerfSonar node was upgraded, and again in March 2014 by using a 10 gig interface from GSFC-ENPL-PTH. The thrupt is much higher than the modest requirement, so the rating continues **Excellent**.



User flow from GSFC to Oxford averaged 440 kbps for this period, a bit above the requirement, and close to the 490 kbps during the previous period.

15) UK, London: (University College)

Teams: MODIS, MISR

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/UCLSCF.shtml>Rating: Continued **Excellent**

Domain: ucl.ac.uk

Test Results:

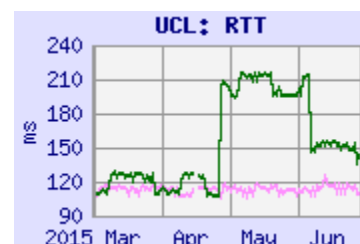
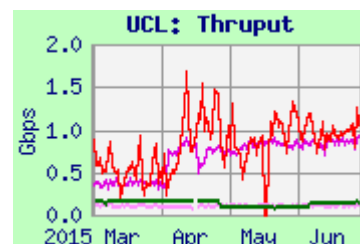
Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	146.3	136.4	45.3	NISN / MAX / Géant / JAnet
GSFC-ESDIS-PTH	147.3	104.8	56.6	MAX / I2 / Géant (DC) / JAnet
GSFC-ENPL-PTH	1043.6	812.5	523.7	
EROS-PTH	1588.9	930.9	275.2	StarLight / I2 / Géant (DC) / JAnet

Requirements

Source Node	FY	kbps	Rating
LaRC DAAC	'12 –	556	Excellent

Comments: Testing from LaRC PTH and GSFC-ESDIS-PTH since late 2010 is by nuttcp pulls, initiated at UCL. Testing from GSFC-ENPL-PTH and EROS-PTH was switched in January to use a PerfSonar server at UCL, with improved results.

Thruput from LaRC PTH dropped when the RTT increased in April and May – no change in the path was observed, however. But the median daily worst thrupt from LaRC PTH remained well above 3 x the requirement, so the rating remains **Excellent**. Thruput from GSFC-ESDIS-PTH was stable.



16) British Atmospheric Data Centre

(Rutherford Appleton Laboratory)

Team: HIRDLS

Rating: **N/A**

Domain: rl.ac.uk

Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtml**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ESDIS-PTH	130.5	116.7	79.4	MAX / I2 / Géant (DC) / JAnet
GSFC-ENPL-PTH	4007.1	3131.3	1804.6	
GSFC-NISN-PTH	557.1	466.2	317.2	NISN SIP / Level3 / JAnet

Requirements:

Source Node	FY	kbps	Rating
GSFC	'02 – '13	190	N/A

Comments: There are no longer any requirements to BADC in the database – therefore no rating is assigned.

The old server at BADC was retired in mid June. Testing from GSFC-ESDIS-PTH was discontinued at that time, since EBnet firewall rules prevent using the dynamic ports employed by bwctl servers. Thruput from GSFC-ESDIS-PTH before that was mostly steady, and consistently much higher than the previous requirement, so the rating would continue to be **Excellent**.

Testing from GSFC-ENPL-PTH was switched in January to a PerfSonar server at BADC. Performance was much higher than to the previous test node.

Testing was added from GSFC-NISN-PTH in May to the same PerfSonar server at BADC. The route via NISN SIP did not use Geant, but commodity internet instead. Performance quite good for that route..

User flow averaged 15.8 mbps this quarter, mostly due to a burst of about 500 mbps on May 13 and 14. This is waaaay above the previous requirement, and last quarter's flow.

